377th Mission Support Squadron grabs honors

The 377th Mission Support Squadron was rated tops in the Category II division in the Air Force Materiel Command's 2003 Mission Support Squadron Awards.

The squadron rating criteria includes recognition for squadron excellence, dedication and creativity in accomplishing the mission.

Kirtland AFB was also recognized for having the Outstanding Education Services Center in the command.

In the Category I, Enlisted Professional Military Education Achievement, Staff Sgt. Erin L. Landers took the top placing.

In Category V for the Air Force Education and Training Manager Awards, Circe Woessner took the honors.

Teresa L. Reinhard won the Category I division for the Outstanding Family Support Individual or Family Readiness Individual Award.

Staff Sgt. Erin L. Landers

Circe Woessner

Teresa L. Reinhard

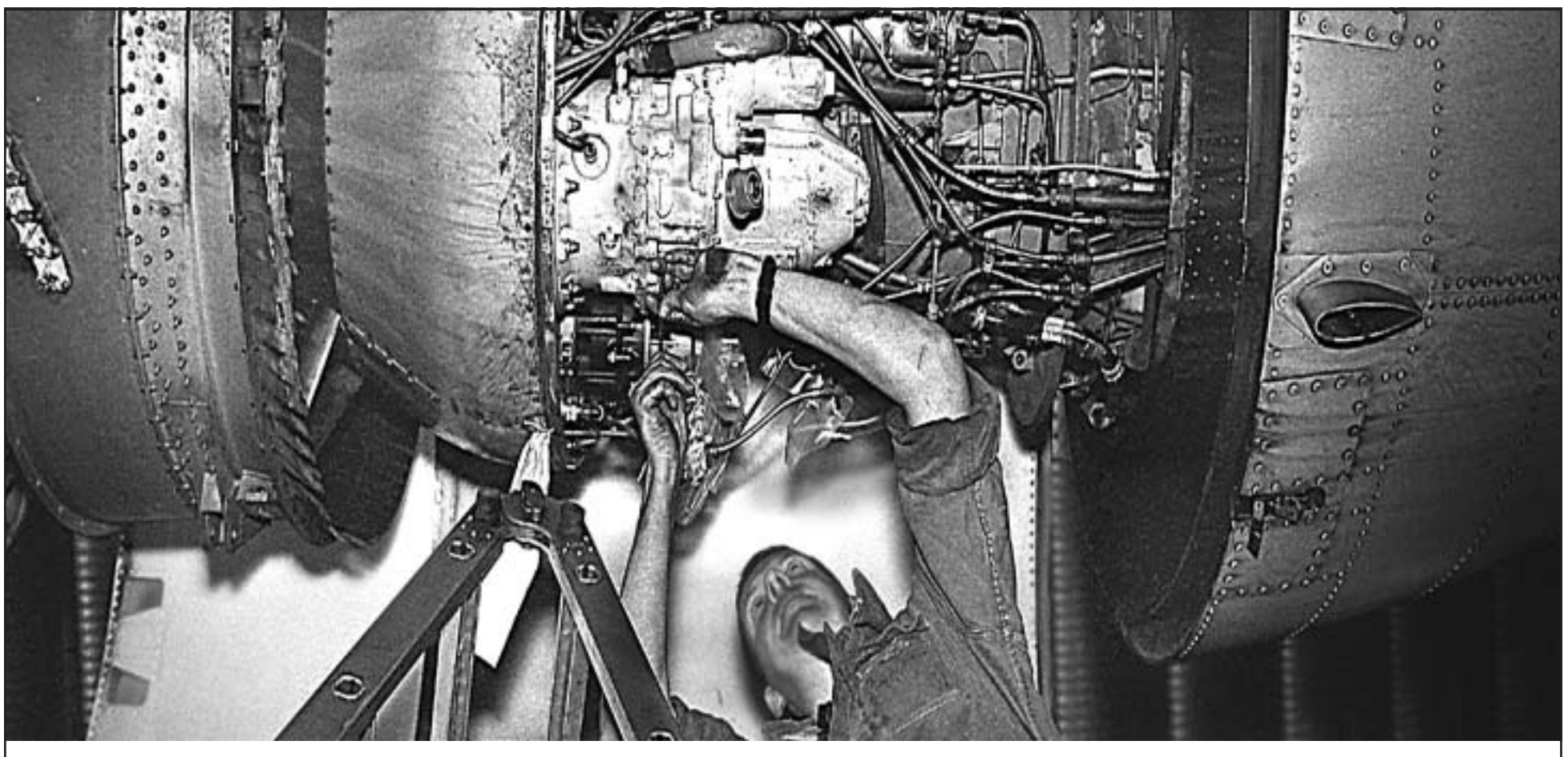
Cops, Services establish action lines

"Action lines" for customers to address concerns and questions to the squadron leadership of the 377th Services Squadron or the 377th Security Forces Squadron have been implemented.

The telephone number for the services squadron is 846-0588, and the telephone number for the security forces is 853-7447.

Callers will receive timely, personalized responses.

Continue dialing 911 or 853-9111 or the Law Enforcement Desk , 846-7913, for all police and security emergencies.



AFRL computer guides NASA rover to Mars

BY JOHN BROWNLEE
Air Force Research Laboratory
Space Vehicles Directorate
Public Affairs

Radiation-resistant computers developed here by the Air Force Research Laboratory helped not only steer NASA's Mars Exploration Rovers to the red planet last week, they also guided them to a safe and spectacular landing on Mars' rocky surface.

AFRL's Rad6000 32-bit microprocessors, manufactured for the Air Force by BAE Systems, controlled the spacecraft during its 7-month flight from Earth. The tiny microchips will also orchestrate the Rovers–named Spirit and Opportunity–as they move about the planet searching for signs that water might once have existed on our neighbor.

"NASA chose AFRL microprocessors because they are proven reliable, rugged and fully compatible with their systems," said Creigh Gordon, an engineer assigned to the AFRL's Space Vehicles Directorate.

These computers can withstand the harsh radiation environment of space and operate reliably over long-term missions. They control all data stream telemetry between the spacecraft and controllers on the ground.

The Rad6000 was not only the world's first radiation-hardened 32-bit microprocessor; it was also the most complex, containing more than one million transistors. And transistors run the show.

Like neural connections in the human brain, transistors inside computer chips help manage the flow of electrical energy by directing it through a maze of silicon-based circuits. Transistors act like switches at electronic junctions to speed electrons to their intended destinations so that desired spacecraft and rover functions can be performed.

Constant bombardment by radiation, however, generates unwanted electrical charges inside transistors, building to the point that the transistor, or switch, can no longer control the electron flow. Consequently, overcharged transistors shut down, and failed electronics mean dead missions and the loss of hundreds of millions of dollars. Much of AFRL's work in electronic spacecraft components prevents such losses.

"Through our efforts within the Space Vehicles Directorate, the Air Force has made significant investments into radiation hardening fabrication technologies and the space electronics based on them," said Gordon. "Contractors such as BAE Systems and others now have the ability to manufacture such devices, which results in better products for us, NASA, the Defense Department, as well as the commercial customer," he added.

Before AFRL researchers stepped in a few years ago, Gordon explained, the Defense Department and NASA paid from $50 million to $100 million for each processor in development and manufacturing costs. Now, after AFRL involvement, the price of a typical processing module dropped to between $500,000 and $2 million and is available as off-the-shelf hardware.

As a direct result, microprocessor performance has improved a hundredfold. "That's an additional value of a military laboratory helping to transform and transfer technology to military and civilian users—it maximizes taxpayer investment," Gordon said.

Courtesy photo

Artist's rendering of Mars Rover Spirit on Mars.

"By creating new circuit designs and the processes by which they are constructed, using different materials, and by building-in safeguards such as backup subsystems, the Air Force-industry team has also significantly increased the life span for spacecraft missions by making electronic systems such as microprocessors more resilient to the catastrophic effects of radiation," said Gordon.

More than 60 Air Force, DOD, NASA, and commercial space systems are now using this technology and better than 90 percent of satellites launched today rely on radiation-hardened processors developed by AFRL's Space Vehicles Directorate.